Tracing the Map in the Age of Web 2.0

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> In modern Western society maps quickly became crucial to the maintenance of state power—to its boundaries, to its commerce, to its internal administration, to control of populations, and to its military strength. Mapping soon became the business of the state: cartography is early nationalized. (Harley 1989, 12)
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> Cartographers manufacture power: they create a spatial panopticon. It is a power embedded in the map text. (Harley 1989, 13)
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> [T]echnological change […] is never a truly exogenous one. On the contrary, the very nature of the Digital Revolution depends upon the social, economic, and political variables that it is also hypothesized to affect. (Boas and Dunning 2005, 5)

1. Introduction

In his now-classic essay "Deconstructing the Map," published a quarter century ago in *Cartographica*, J.B. Harley questions the objectivity and neutrality of cartographic knowledge production and calls for examining the role of the map as a form of power-knowledge. The first two quotes listed above exemplify the distinction between external and internal power in cartography that underpins Harley's conception of maps and mapping. As the contributions to this special issue make clear, Harley's work has been highly influential in the emergence of critical cartography and critical GIS since the early 1990s (also, see Pickles 1995; 2004; Schuurman 2000; Crampton 2003; Harris and Hazen 2006; Kitchin and Dodge 2007). Elsewhere, there have been insightful analyses that explore the intellectual influences of Harley's work (e.g., Crampton 2003; Edney 2005). In this review essay, I would like to reflect on how revisiting Harley's (1989) arguments might be helpful in addressing some of the questions raised in critical cartography and GIS, particularly regarding the emergent mapping practices facilitated by a new array of Web 2.0 technologies and mobile devices since the mid-

2000s. I intend to highlight the intersection between technology, text, and knowledge, informed by the rich traditions in critical cartography and GIS, and related studies, indicated by the third quote listed above.

In particular, drawing upon the work of Foucault and Derrida, Harley (1989) advances three threads of arguments to deconstruct the map. First, he examines how cartographic rules might be intertwined with social relations and calls for more attention to the "social context" in which cartographic knowledge is "fashioned" (Harley 1989, 7). Second, Harley looks into the content and representation of maps, viewing them as a "cultural text" and highlighting the rhetorical dimension of map-making (1989, 7). Third, focusing on how maps might work as a form of power-knowledge, he discusses the need to uncover how power is exercised both externally and internally in cartography. Investigating the power external to maps, which Harley considers as "the most familiar sense of power in cartography," involves studying the processes by which maps are linked to "the centres of political power" (1989, 12). By contrast, the power internal to cartography, which might be less investigated but is equally central to the question of how maps do work in society, is concerned with "the political effects of what cartographers do when they make maps" (Harley 1989, 13). As such, it is important to examine cartographic processes such as "the way maps are compiled and the categories of information selected" through which power might be inscribed and exercised consciously and unconsciously (Harley 1989, 13). In these cartographic processes, certain forms of representation might be promoted and legitimized, especially concerning those images that are mass-produced. In conclusion, Harley emphasizes the importance of a deconstructionist approach in studying the history of cartography through three functions. First, the epistemological myth of objective cartographic knowledge can be challenged. Second, this approach invites different nuances of investigating the political effects of maps in society. Lastly, it can facilitate more engagement with contributions to the interdisciplinary body of work on text and knowledge from map history.

The deconstructionist approach has played a significant role in many debates and critiques of mapping and GIS (e.g., Schuurman 2000; Crampton 2003; Pickles 2004; O'Sullivan 2006; Kitchin and Dodge 2007). Crampton (2003) suggests that Harley's work is valuable in problematizing the map as a form of power-knowledge, yet it also has a tendency to focus on power-as-repression (Pickles 2004), and others have highlighted the limits to Harley's distinction between external and internal power (Belyea 1992; Rose-Redwood, this issue). Kitchin and Dodge (2007) further argue that maps, rather than occupying a secured ontology, are always in the making. As such, it is vital that we continue to investigate how mappings take place and what work they might do in these processes. What seems to be shared in the above discussions is a keen attention to documenting, unravelling, and analysing how maps and mappings come into being and do work in society. Many studies have continued these enquires in critical cartography and GIS research, which could be identified as, perhaps broadly, efforts to trace the map.

Harley's deconstruction of the map highlights the importance of interrogating the social and the political concerning map-making and its effects in society (Crampton 2003). What seems to have been less explicitly discussed is Harley's (1989) conception of the relation between mapping and the *technological*. In many ways, the technological is part of what Harley seeks to deconstruct and dismantle concerning the objectivity of map-knowledge. Yet what is worth noting is how the notion of productive power (e.g., Pickles 2004) might help us further understand the intersections between the technological, the political, and the social regarding the power of maps. Here, "the technological" is broadly defined, referring to technological artefacts and associated knowledges and practices that constitute, and give rise to, these artefacts and their usage. There has been a rich body of work examining the social implications of mapping and GIS technologies (e.g., Pickles 1995; 2004; Schuurman 1999; Harvey and Chrisman 2004; Lin and Ghose 2010). These studies are informed by a wide range of

theoretical approaches, including political economy, notions of governmentality and power-knowledge, and actor network theory (c.f. Elwood 2014; Pickles 2004; Rose-Redwood 2012; Lin 2013a). Together, these studies provide convincing evidence of how mapping, GIS technologies, and the social conditions within which they are situated are mutually constituted, and how these technologies both constrain and enable certain types of knowledge production and politics. As such, it is important to continue investigating how new types of geospatial technologies and data emerge and do work in the world, adopting a Foucauldian notion of productive power.

In this way, it would be useful to revisit some of these intersections and think through what might be entailed in adding the "technological" into Harley's line about integrating the history of cartography into the "interdisciplinary study of text and knowledge" (1989, 15). In the remainder of this essay, I would like to highlight the ongoing discussions of the emerging, heterogeneous mapping practices enabled by Web 2.0 technologies and location-aware devices (e.g., Crampton 2009; Elwood, Goodchild and Sui 2012), which are commonly referred to in the literature as volunteered geographic information (VGI) (Goodchild 2007). VGI includes both the practices of providing geographic information by non-experts knowingly through an array of technologies (such as Web mapping, map mash-ups, and geotagging) and the forms of data that these practices produce. Examples include OpenStreetMap, Google Maps/Earth, and Ushahidi. The term "Web 2.0" was popularized by Tim O'Reilly (2005) and emphasizes the notion of the Web as a "new" platform that facilitates user contributions and user-customized services and data flows, examples of which include blogs, wikis, and social media websites. I use the phrase "Web 2.0 Age" here to indicate the context embodying these technological transformations.

2. Tracing the Map in the Web 2.0 Age

Specifically, how might we trace the map in a Web 2.0 age? Addressing this question not only underlines the importance of providing multiple readings of the map and its power, but also possibly opens up more room to think about ways of engaging with different forms of making and remaking of the map. I would therefore like to address three issues briefly regarding the intersection of Web 2.0 technologies and mapping practices. These three issues are part of the ongoing debates in the rich literature of critical cartography and GIS. Through this brief review, which is limited in scope, I call for continuous attention to the notion that technological change is "never a truly exogenous one" (Boas and Dunning 2005, 5) and to how digital mapping technologies are currently blurring lines between "readerly" texts and "writerly" texts (Pickles 2004).

2.1 Who are the VGI Mappers?

Traditional GIS and conventional mapping practices tend to be carried out by governmental agencies and professionals given the technical skills and costs involved in collecting and analysing the data. As such, the rich body of work on public participation GIS and participatory mapping has sought to address the issue of uneven spatial knowledge production and access to mapping and data construction (e.g., Sieber 2006). Additionally, studies on the social construction of GIS (e.g., Harvey and Chrisman 2004) have investigated the relationship between the organisational practices and institutional arrangements and the ways GIS data and technologies are used and developed. The emergence of Web 2.0 technologies and the increasing availability of satellite imagery and mobile devices have enabled the rapid growth of geographic information production and dissemination by lay persons (e.g. Haklay, Singleton, and Parker 2008), which in turn have implications on spatial knowledge production and social relations (e.g., Zook and Graham 2007; Wilson and Graham 2013). Although Harley (1989) contends that cartographers produce power, the increasingly blurred line between the map-

maker and map-user raises all sorts of question about who these mappers are and what might constitute their motivations of engaging with mappings (e.g., Budhathoki and Haythornthwaite 2013; Lin forthcoming). Moreover, how might these new geospatial technologies constitute different subjectivities in the process of constructing maps that do not have a secured ontology (e.g., Elwood 2010; Lin 2013b)?

2.2 What Kinds of VGI Mappings?

Harley (1989) insists that maps should be read as "cultural texts," yet VGI mapping practices are highly heterogeneous, which might invite and necessitate different ways of reading and engaging with these practices. One area of current interest considers the various forms of spatial knowledge production (e.g., Elwood, Goodchild, and Sui 2012), resulting in fruitful discussions about investigating these mappings as visual practices (e.g., Elwood 2011). Studies have also explored artistic engagements with mappings (e.g., kanarinka 2006) and the performative dimension of VGI mappings (e.g., Lin 2013c). In addition, there is an emerging literature on sound mapping using Web 2.0 technologies constructed with user-generated contributions. Questions such as what kinds of experiential knowledge might be produced or shared in these mappings can help to illustrate the power of maps in different forms and different contexts. In this sense, these engagements move beyond Harley's textual or representational approach to maps (e.g., Pickles 2004). It is thus important to continue the project of tracing these mapping practices to investigate how they are formed and acted upon, which may in turn constitute new knowledge politics, reconfigure different power-geometries, or reinforce existing power relations, relating to the third issue addressed below.

2.3 Politics of VGI Mappings

Over two decades after the publication of "Deconstructing the Map," it has become commonplace to assert that maps have politics. Indeed, critical cartography and GIS scholars have long paid attention to the socio-political implications of mapping and geospatial technologies. VGI practices introduce both opportunities and challenges regarding grappling with these questions. On the one hand, the availability of these mappings and their relatively easier access may facilitate new forms of participatory mapping, civic engagement, and knowledge politics (e.g., Elwood and Leszczynski 2013). On the other hand, these mappings may perpetuate existing social divisions as well as introduce new forms of exclusion and surveillance (e.g., Crutcher and Zook 2009). These more recent investigations echo the importance of paying attention to the politics of mapping which Harley (1989) highlights in "Deconstructing the Map" and related works. Yet, they also underline the notion of productive power through mappings. With the rapid growth of VGI mapping practices, continuous efforts are needed to investigate the implications of these practices and processes in various contexts as VGI can easily be "mass-produced" although through different channels in the so-called Web 2.0 age.

3. Conclusion

In this review essay of Harley's (1989) seminal work on deconstructing the map, I have attempted to address the importance of paying attention to the intersections between technology, text, and knowledge, in light of Harley's work as well as other subsequent studies in critical cartography and GIS. Harley's work underscores the importance of investigating the social and the political dimensions of map-knowledge. Yet it is also important to read and engage with the map through the technological, and, as numerous scholars have argued, the power of maps needs to be investigated through the notion of productive power (e.g., Pickles 2004). In the age

of Web 2.0, which has also witnessed new forms of social division and a growing digital divide, questions about how power might be exercised and constituted through mappings remain as important and relevant as ever. In particular, I discussed this intersection in relation to the growth in VGI mapping practices that have brought significant changes to the way geographic data are created and disseminated in order to call for more research on situating, tracing, understanding, and potentially remaking the map in the age of Web 2.0.

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